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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/919,452	07/31/2001	Arthur W. Wetzel	044595-5004	3675

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THE LAW OFFICE OF RICHARD W JAMES
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EXAMINER

AZARIAN, SEYED H

ART UNIT	PAPER NUMBER
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2625

DATE MAILED: 04/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/919,452	WETZEL ET AL.	
	Examiner	Art Unit	
	Seyed Azarian	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-74 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19-74 is/are allowed.
- 6) ☒ Claim(s) 1-3 and 16-18 is/are rejected.
- 7) ☒ Claim(s) 14 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>8/16/04, 12/24/04</u> . | 6) <input type="checkbox"/> Other: _____ |

RESPONSE TO AMENDMENT

1. Applicant's amendment filed, 12/24/2004, see page 12 through page 20 of remarks, with respect to the rejection of claims 1- 13, 16-43, 45-50, 53-54 and 56-74 have been considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground (s) of rejection is necessitated by applicant's amendment is made in view of Soenksen (U.S. patent 6,711,283).
2. Applicant argues in essence regarding claim 1, that Ortyn does not disclose, "capture of a low resolution image and the capture of a high resolution image of the target that corresponds to the pixels of the low resolution image".

Contrary to the applicant's assertion, limitations in the amended claim, the examiner is using the new reference supplied with this action: Soenksen (U.S. patent 6,711,283) discloses, digitizing the sample 12 into a large contiguous image, typically at the low optical resolution and variety of method such as the application of morphological algorithms to identify and locate specific types of objects in the image 76, sample 12, (identifies target image), and a decision to return for a "high resolution" interrogation of selected areas of the sample 12, using information obtained from the image 76 (column 20, line 52 through column 21, line 12).

In response to Applicant's argument regarding claim 8, that Ortyn does not disclose "imaging apparatus having a processor that develops a focus based on stage position and object distance for at least three selected points".

The Examiner disagrees and indicates, during system integrity checking, the central computer, running a real time operating system controls the automated microscope and the

“processor” to acquire and digitize images from the microscopes. The flatness of the slide may be checked, by contacting the four corners of the slide using a computer controlled touch sensor (column 7, lines 12-27).

Furthermore, in response to applicant’s argument, regarding claim 16 that Ortyn does not teach “pulsed light that illuminates in response to a stage”.

Contrary to the applicant’s assertion, Ortyn discloses, Fig. 4, evaluation apparatus uses pulsed for illumination. A beam splitter is positioned to receive the light to split the light into a first beam and second beam wherein the second beam provides illumination to condenser lens for a microscopic evaluation (column 12, lines 22-47).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-13 and 16-18, are rejected under 35 U.S.C. 103(a) as being unpatentable over Ortyn et al (U.S. patent 5,875,258) in view of Soenksen (U.S. patent 6,711,283).

Regarding claim 1, Ortyn discloses an imaging apparatus, comprising, a motorized stage (column 7, lines 38-49, stage 21, and Fig. 1, column 6, line 66 through column 7, line 13, microscope, slide and motor drivers 526);

a camera focused relative to said motorized stage; and a processor (Fig. 1b, item 550 processor), coupled to said camera (CCD camera 512), wherein said processor contains instructions which, when executed by said processor, cause said processor to, capture low resolution image that is incident on said camera (column 6, lines 44-65, capturing image comprising automated microscope, also column 20, lines 12-39);

wherein the image includes a plurality of pixels and the pixels have a characteristic (Fig. 6, column 13, lines 10-33, array of pixels for each acquired image is computed);

establish the characteristic for each pixel, and determine which pixels contain a target image based on the characteristic of the pixels (column 13, lines 11-25, calibration and test target into the optical path, also column 14, lines 18-34, target is introduced into the optical path at process step and capturing image pixels and generating histogram, and evaluating comparison).

However regarding claim 1, Ortyn fails to disclose, "capture a high resolution image of the target that corresponds to the pixels of the low resolution image". On the other hand Soenksen discloses, digitizing the sample 12 into a large contiguous image, typically at the low optical resolution and variety of method such as the application of morphological algorithms to identify and locate specific types of objects in the image 76, sample 12, (identifies target image), and a decision to return for a "high resolution" interrogation of selected areas of the sample 12, using information obtained from the image 76 (column 20, line 52 through column 21, line 12).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made, to modify Ortyn invention according to the teaching of Soenksen because it provides and ensure that higher resolution and high quality image is captured by the

scanning processed for desired magnification, which can easily be implemented in an image processing such as microscope device.

Regarding claim 2, Ortn discloses an imaging apparatus of claim 1, wherein said characteristic includes pixel intensity (column 18, lines 40-52, pixel intensity).

Regarding claim 3, Ortn fails to disclose, "character istic includes color pixel". On the other hand Soenksen in the same field microscope teaches the color array detects the RGB intensities required for obtaining a color image (Fig. 3B color array 86, and pixel element 72, column 16, lines 13-27).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made, to modify Ortn invention according to the teaching of Soenksen because it provides the difference between the highest and lowest frequencies, which contributes to color quantitation allows the viewer to easily visualize between normal and abnormal for better result and accuracy.

Regarding claim 4, Ortn discloses the imaging apparatus of claim 1, wherein said processor determines which pixels contain a target image based on the relative intensity of the pixels and further, determines a mean intensity of the pixels, compares the intensity of each pixel to the mean intensity (Fig. 6, column 13, lines 11-32, also column 13, lines 18-33, target of optical pat and determining mean intensity of pixels and comparing);

and divides the pixels into a group of non-target image pixels having high intensities and a group of target image pixels having intensity lower than the high intensity pixels (Fig. 12, column 15, lines 17-35, different between highs and lows pixel values, also column 7, lines 12-27, running a real time operating system controls the automated microscope and the "processor"

to acquire and digitize images from the microscopes. The flatness of the slide may be checked, by contacting the four corners of the slide using a computer controlled touch sensor.

Regarding claim 5, Ortyn discloses the imaging apparatus of claim 1, wherein said processor determines which pixels contain a target image based on the relative intensity of the pixels and further, determines an intensity standard deviation for the pixels that provides an amount of variation in pixel intensity, compares the intensity of each pixel to the intensity standard deviation; and divides the pixels into a group of non-target image pixels having low standard deviations and a group of target image border pixels having a standard deviation that is greater than the standard deviation of the pixels having low standard deviations (see claim 4, also column 47, lines 5-43, standard deviation of minimum and maximum pixel intensities).

Regarding claim 6, Ortyn discloses the imaging apparatus of claim 1, further comprising a pulsed light directed toward said motorized stage (column 6, lines 45 through column 7, line 12, provide illumination intensity and motor drive 522, also column 12, lines 22-35, pulse).

Regarding claim 7, Ortyn discloses the imaging apparatus of claim 1, further comprising a stage position sensor adjacent said motorized stage (column 41, lines 47-66, moving stage for best focus).

Regarding claim 8, Ortyn discloses an imaging apparatus, comprising: a motorized stage (Fig. 1, column 6, line 66 through column 7, line 13, motor drivers 526);

a camera having a lens directed toward said motorized stage (Fig. 15, column 18, lines 28-38, plurality of lens);

and a processor coupled to said camera, wherein said processor contains instructions which, when executed by said processor, cause said processor to (column 6, lines 44-65, capturing image comprising automated microscope);

select at least three points of a sample (column 13, lines 10-33, array of pixels for each acquired image), adjacent said motorized stage, determine stage position for each selected point, focus said camera on each selected point; determine object distance from the camera lens to the sample at each selected point, and develop a focus surface based on stage position and object distance for the at least three selected points (column 35, lines 34-59, determine positioning from different distance, also column 36, lines 48-67, optical path and different points).

Regarding claim 10, Ortyrn discloses the imaging apparatus of claim 9, wherein selecting points dependent on a characteristic of the image of those points includes selecting the darkest regions (column 46, lines 47-58, dark field).

Regarding claim 11, Ortyrn discloses the imaging apparatus of claim 9, wherein selecting points dependent on a characteristic of the image of those regions includes selecting the lightest regions (Fig. 14, column 18, lines 3-26, respect to the light level).

Regarding claim 12, Ortyrn discloses the imaging apparatus of claim 9, wherein selecting points dependent on a characteristic of the image of those regions includes selecting points having a high contrast relative to the regions (Fig. 17, column 19, lines 39-63, contrast curve).

Regarding claim 13, Ortyrn discloses the imaging apparatus of claim 8, wherein said selecting at least three points of a sample adjacent the motorized stage includes, determining a distribution of the at least three selected points within the sample, determining whether at least one selected point lies within each of at least two predetermined areas; and selecting additional

points until at least one point lies within each predetermined area (see claim 8, also column 42, lines 1-27).

Regarding claim 17, Ortyn discloses the imaging apparatus of claim 16, further comprising a processor coupled to said camera, said pulsed light and said stage position sensor, wherein-said processor contains instructions which, when executed, cause said processor to, initiate motion of the motorized stage; energize the pulsed light when the stage position sensor indicates the motorized stage is in a predetermined position; and capture an image by way of the camera while the pulsed light is energized (column 35, line 60 through column 36, line 9frequency energy in the focus plus).

Regarding claim 18, Ortyn discloses the imaging apparatus of claim 16, wherein the motorized stage moves continuously while capturing images (column 41, line 47 through column 42, line 12, the stage continues to move).

Regarding claims 9 and 16, it recites similar limitation as claims 1 and 8 are similarly analyzed.

Allowable Subject Matter

5. Claims 14 and 15, are objected as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitation of the base claim and any intervening claims.

Allowable claims

6. The following is an examiner's statement of reasons for allowance.

The present invention relates to microscopic digital imaging of complete tissue sections for medical and research use.

The claim 19 representative of claim 53, are allowable due to the optical system that comprises at least one camera, a motorized stage for moving a slide while an image of the slide is captured, a "pulsed light illumination system that optically stops motion on the motorized stage while allowing continuous physical movement of the motorized stage, and a stage position detector that controls firing of the pulsed light illumination system at predetermined positions of the motorized stage".

The closest prior art of record (Ortyn) teaches automated biological specimen analysis system that evaluate, processing quality, illumination quality, image quality and position quality. But neither teach or suggest that "pulsed light illumination system that optically stops motion on the motorized stage while allowing continuous physical movement of the motorized stage and a stage position detector that controls firing of the pulsed light illumination system at predetermined positions of the motorized stage".

These key features in combination with the other features of the claimed invention are neither taught nor suggested by the art of record.

Claims 19-74 are allowable.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Azarian whose telephone number is (571) 272-7443. The examiner can normally be reached on Monday through Thursday from 6:00 a.m. to 7:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached at (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR.

Status information about the PAIR system, see [http:// pair-direct.uspto.gov](http://pair-direct.uspto.gov). Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seyed Azarian

Patent Examiner

Group Art Unit 2625

April 11, 2005

